

**SPECIAL
 POINTS OF IN-
 TEREST:**

- Check out the Nutrient Management Website at www.ndsu.edu/nm for more information.
- Email Chris at Chris.Augustin@ndsu.edu to receive this newsletter.
- Do you need manure applied? The Nutrient Management Website has a manure applicator directory.

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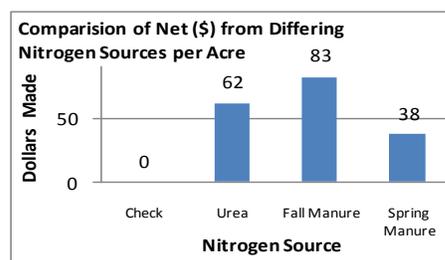
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Cost & Benefits of Manure Application Timing

Ron Wiederholt, of the Carrington Research Extension Center has spent the past two growing seasons studying and comparing the effects of manure nitrogen application timing (spring vs. fall) and urea on spring wheat. This study had 4 treatments. One had no nitrogen (check) and another had 150 pounds of spring applied conventional nitrogen (Urea). The two other treatments had 150 pounds of nitrogen, but from manure applied in the spring (Spring Manure) and fall (Fall Manure). Commercial phosphorus was added to the Urea treatment to meet the phosphorus levels of the manure treated fields. Potas-

sium was not added since soil tests indicated that soil levels were sufficient.

It was found that spring wheat yield and percent protein followed the same trend: Urea (48bu/ac, 15.3% protein) > Fall Manure (45bu/ac, 14.5% protein) > Spring Manure (40bu/ac, 14.1% protein) > Check (30bu/ac, 13.9% protein). Keep in mind that the 2008 and 2009 growing seasons were abnormally cold and may have lead to the inferior yield and quality of the manure treatments.



Nitrogen prices were then added to the study to find what will make a producer the most money. A survey of area fertilizer dealers were contacted for fertilizer price quotes. Nitrogen from urea was determined to be \$0.45/lb. The value of manure nitrogen (\$0.11/lb) was determined by the cost of hauling and applying the manure.

Continued on pg. 3

Spring Cleaning Pens Lowers Odors

MANHATTAN, Kan. - The expression "spring cleaning" conjures images of spotless households, but it can apply to cattle operations, too.

Spring is a good time for producers to clean feedlots or areas of manure accumulation, once cattle are removed for summer grazing, said Kansas State University's Joel

DeRouchev.

If not properly cleaned and maintained, confined feeding pens and temporary feeding sites for wintering cows or winter-backgrounding calves are prime contributors to odor emissions, said DeRouchev, who is an animal scientist with K-State Research and Extension.

In addition, fly production from those sites is much greater when manure and wasted feed are present. This, in turn, creates a nuisance and the potential for reduced animal performance for the remainder of the summer.

Mary Lou Peter-Blecha
 Kansas State

Commentary from the CAFO Corral



Traveling gun applying containment pond effluent on a field.

“During the spring melt, monitor your pond and record its level regularly. Inspect the diversions and dikes for erosion...”

Although it still feels a lot like winter, the calendar tells us that the spring thaw can't be too far away. With all the snow out there, we could be facing some severe runoff and flooding events again this spring. Now is the time to prevent potential flood-related problems by performing some simple maintenance on parts of your manure management system.

1. Clear snow and ice frozen pipes, culverts and the solids separator. It is best to remove the snow and ice prior to melting. Salt may be useful to melt ice in structures that are difficult to clear by mechanical means.

2. Remove snow drifts from open diversion ditches to ensure they will flow freely when the first melting occurs.

3. Review your operations and maintenance (O/M) plan for any maintenance items unique to your system.

During the spring melt, monitor your pond and record its level regularly. Inspect the diversions and dikes for erosion, particularly those areas that did not have established vegetation last year. Last spring, the most common cause of overflows was clean water entering the containment area due to overtopping of clean-water diversion dikes. Recently completed projects with bare earthwork sustained the most damage.

If your runoff pond does fill up, it is best to wait to pump it until the water can be applied to dry cropland, hay land or pasture. When possible, a sample of the runoff water should be tested prior to application. Contact your local extension agent for a list of laboratories that can analyze manure samples. Runoff water can often be applied up to the infiltration rate of the soil.

If the runoff pond is in immediate danger of overflowing, it is still preferable to control that overflow by pumping, siphoning, or using the designed spillway. An uncontrolled overflow can damage the pond structure. If pumping a runoff pond is needed to prevent an immediate overflow, steps can still be taken to minimize the impact, including:

1. Do not pump from the very top or bottom of the pond; pull water from the middle.
2. Direct the discharge to an area where it will have the least environmental impact, preferably away from any defined drainage
3. Spread the runoff water out over as much area as possible, preferably on grass or hay land with vegetation

Extraordinary measures should be taken to prevent liquid manure storage ponds from overflowing; such discharges can cause severe environmental impacts.

In the event of an overflow or damage from excessive runoff, notify the North Dakota Department of Health, Division of Water Quality, at 701.328.5210. Keep track of the volume and duration of overflow. (The flow rate over a dike can be estimated if you know the depth and width of the overflow.) Keep records of expenses incurred due to flooding; these can be important if federal reimbursement is made available. If you have any questions or concerns, please call the number above or contact us at www.ndhealth.gov/WQ

Karl Rockeman— North Dakota Department of Health



Pumping water effluent from a containment pond.

Why Remove Manure From Lots and Barnyards?



Pen cleaning with a box scraper.

Allowing manure to build up in barnyards and open lots when it is wet makes it harder for animals to move and feed. They use more energy to walk, and contribute more pollutants to runoff when it rains. Collect manure from barnyards and lots monthly to reduce buildup and

improve manure containment. Pull type blade such as a box scraper or a three point blade, work best to clean lots. Push type blades gouge and make it successively difficult and more time consuming to clean manure. Many at first think that monthly cleaning is excessive, but the same amount of manure is harvested (and time invested) whether done annually or monthly, it's just a matter of when.

Studies show that 4 inches of mud reduces feedlot cattle's feed efficiencies up to 10 percent per day. Mud makes it

harder for cattle to move around and reduces their ability to access all parts of the bunk. A tremendous amount of energy must be expended walking through just 2 inches of mud; that energy reduces gain. Harvest manure monthly (or when manure depth is 3 inches) by a pull type blade to minimize mud caused by excessive manure accumulation.

Manure should be stockpiled in locations where runoff will not drain into surface water or areas that are susceptible to leaching. Chris Henry-University of Nebraska; eXtension.org

“Studies show that 4 inches of mud reduces feed efficiencies up to 10 percent per day...”

Composting Demo Day is Coming!

Last year the Carrington Research Extension Center held a Composting Demonstration Day. The morning comprised of lectures, while the afternoon showed different compost turners. This year will follow the same format.

The date and agenda has yet to be decided, but is being determined, and will be in late July or early August. The next issue of Nutrient Management News will have more information. If you have any topic or equipment suggestions, please contact Chris at 701-652-2951.

Cost & Benefits of Manure Application Timing

From pg. 1.

The nitrogen bill was \$67.50/ac and \$16.50/ac for the urea and manure treatments respectively. The cost to apply the Urea was not accounted for.

The gross income was determined by multiplying the price of a bushel of wheat at a certain percent protein by the yield for a given treatment. The Urea grossed the most (\$273.60/ac) with 48bu/ac at \$5.70/bu. Fall manure grossed \$243.00/ac after it yielded 45bu/ac at \$5.40/bu. The Spring Manure produced 40bu/sc at \$4.85/bu and as a result grossed \$198.00/ac. The Check was \$4.80/bu and grossed the least at \$141.00/ac.

Out of the four treatments, Urea grossed the most by producing the most and highest quality wheat. However, the nitrogen bill was four times greater (\$67.50/ac) than the manure treatments (\$16.50/ac). By determining the net return (\$ Gross/ac- \$ Nitrogen/ac) from the use of the fertilizer it was found that Fall Manure (\$226.50/ac) netted the most, Urea (\$206.10/ac) was second, Spring Manure (\$181.50/ac) was third and the Check (\$141.00/ac) was last. The return by treatment was: Fall Manure \$20.40/ac > Urea > \$24.60/ac Spring Manure > \$40.50 Check.

This study suggests that urea out produces manure when applied to high, early season

nitrogen demanding crops, such as wheat. However, fall manure can have the most money returned per acre because of its cost effectiveness. Additionally, fall manure applications produce higher yields and better quality spring wheat than spring applied manure.

Chris Augustin



Applying manure to a research plot.

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Manure Testing for Nutrient Management

“Soil tests, manure tests and manure spreader calibration are three essential management practices that allow producers to meet crop yield goals by effectively managing manure,” says Chris Augustin, area nutrient management specialist at North Dakota State University’s Carrington Research Extension Center.

“Sampling and testing manure within a week of an application is very important to achieve accurate results,” he adds. “However, results are only as good as the sample taken.”

Sampling solid manure involves taking about a dozen samples with a shovel from various locations in a pile and mixing those samples together in a plastic 5-gallon bucket. A composite sample then can be collected from the bucket and placed in a plastic container from a testing lab.

Labs that will conduct such tests include the NDSU Soil Testing Laboratory, (701) 231-8942; AGVISE Laboratories, (701) 587-6013; and DHIA Laboratories, (800) 369-2697.

Fill the plastic container about three-quarters full to provide room for air and expansion. Label the bottle, place it in a plastic bag, fill out all the information on the form from the testing laboratory and mail the sample.

Liquid manure should be agitated for two to four hours before sampling. Collect

about six samples by dipping into the manure container and pouring the liquid into a plastic 5-gallon bucket. The samples should be mixed and transferred into a plastic sampling bottle from a manure testing lab. As with solid manure samples, leave some space in the bottle.

Many labs recommend that after collecting the samples, they should be frozen or packed in ice and sent in a cooler. This prevents the samples’ chemical and biological properties from changing.

Labs also recommend sending samples early in the week to avoid weekend layovers and problems with maintaining sample integrity.

Labs can test for many nutrients, but the minimum testing should be for total nitrogen, phosphorus and potassium, Augustin says. Testing manure for inorganic and organic nitrogen can lessen the guesswork that goes into making sure nutrients are available for crops.

For more information on nutrient management, contact Augustin at (701) 652-2951 or chris.augustin@ndsu.edu, or visit the NDSU Nutrient Management Web site at <http://www.ndsu.edu/nm>.

Source: Chris Augustin
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Thanks for reading this volume of Nutrient Management News! You may distribute this in any manner you see fit. If you would like to receive future copies, email me (chris.augustin@ndsu.edu) to be added to the list.

We are always looking for different topics to cover. If you have an idea or an article you would like to submit, email it to me and I will accommodate.

Nutrient Management News is also available on the Nutrient Management Website (www.ndsu.edu/nm).

A new Extension Publication that covers the manure composting process and management will be available in the near future. It is titled, “Composting Animal Manures” and will be available at your County Extension office and on the Nutrient Management Website.